NOTE ON THE INTRODUCTION, CULTIVATION AND PROPAGATION OF *AGAVE RIGIDA* VAR. *SISALANA*, IN THE LAL-BAGH, BANGALORE.

Habitat and distribution.

The Sisal hemp plant is indigenous to Mexico, and is said to derive its commercial name from the Port of Sisal in Yucatan. The parent species, *Agave rigida*, has run into several cultivated varieties, of which the variety *sisalana* is most prized for the quality of its fibre. Henequen and Sisal hemp, are the popular names given to the marketable or prepared fibre of all the cultivated varieties. There are also special vernacular names attached to the several commercial kinds. For many years the Sisal plant has been extensively cultivated in Florida, and from a more recent period in the Bahama Islands. In comparatively recent years the plant has found its way to this country, where it is likely to be of great value.

Introduction to Mysore.

Acting on my advice, and kindly assisted by the authorities at Kew, the late Mr. Ricketts was able, in 1892, to import 5,000 plants direct from Florida. Prior to this date a few plants of *Agave rigida* had found their way into the Botanical Gardens, but it is quite improbable that the variety *Sisalana* had ever appeared in the Province before. We may therefore take 1892 as the starting period of this important cultivation.

Cultivation and experiment.

The plants from Florida arrived in excellent condition and were at once planted out in the Lal-Bagh. In view to hardening them off and inducing them to reproduce their kind, it was decided to plant thickly in an open field which had formerly been cropped with ragi and other dry crops. The bulk of the consignment was therefore laid down in a plot of land measuring only ¼ of an acre. With the exception of occasional thinning out to relieve congestion and meet small indents, the original plants still remain in this position where they form an overcrowded and conspicuous clump. Suckers were allowed to grow and the matured leaves of parent plants have not been cut, hence poling commenced in the 9th year, or in 1901. Poling, or the growth of the floral axis, forming flowers, fruit, seed and adventitious buds, renders propagation easy as each pole gives birth to upwards of 2,000 buds, which shortly develop into bulblets that mature and fall to the ground. This beautiful provision of nature to replace the sterile seed in a perfect and more advanced form of growth is characteristic of the Sisal plant.

It will thus be seen that the main object of cultivation in the Lal-Bagh during the period under report has been to induce poling and render the plants hardy. We shall now have ample material to commence cultivation for another object, if desired, *e. g.*, to produce Sisal hemp, the valuable product of the leaf. During the current official year 45,000 plants have been sold for that purpose, at a cost of Rs. 1,000; a sum which more than twice covers the original outlay for introducing the species from Florida.

In my opinion, cultivation should be left to private enterprise, though, in the case of arid tracts where ragi often fails to reward the raiyat, it may be feasible to substitute a crop of this kind. But that could only be done when a real demand for hemp arises at convenient centres.

The advantages of the cultivation may be briefly stated as follows:—

1. Land of a gravelly and stony nature is suitable.
2. When land is planted up the cultivation practically ceases for a period of 4 years, or until the matured leaves are ready for cutting.
3. On suitable land failure of crop has never been heard of.
4. The profit on an acre of land yielding crop is estimated at £4 to £5 per annum, that is 60 to 75 rupees.

The large succulent growth obtained in rich land is inimical both to the quantity and quality of fibre produced; therefore somewhat poor land of a loose stony nature is always preferred, as in addition to giving better results generally it accommodates a larger number of plants to the acre. Mysore possesses plenty of such land, and if the latter can produce leaves of four feet in length it will do. But there is a reduction in value, as well as difficulty in extracting the fibre, when the leaves are under three feet in length. In Yucatan plants are put out in rows at 7, 8, 9 and even 12 feet apart, according to the nature of the soil. But the general practice is to allow nothing under 400 plants to the acre, while 660 is considered about the maximum number. In the Bahamas the planting is somewhat closer. When a plantation is once established it may be profitably worked for a life-time, care being taken not to let the plants pole or become exhausted from over-cutting. In a large plantation drives are left at convenient intervals to facilitate the easy removal of leaves.

Machinery.

A matter which closely concerns the prosperity of Sisal hemp is the use of proper machinery for the extraction of the fibre. Kindly responding to an enquiry made by me on this subject, Sir Daniel Morris, Commissioner, Imperial Department of Agriculture for the West Indies, writes as follows:—

"In regard to machinery for the treatment of fibre plants such as *Agave sisalana* there appears to be a thoroughly satisfactory machine in use in the Bahamas which will clean about half to three quarters of a ton of fibre per day. This machine is manufactured by T. C. Todd of

Patterson, New Jersey, U. S. A. The machine itself is of considerable size and weight, and costs from £500 to £600. It is usually driven by an oil engine of 4 to 5 horse-power. I believe the total cost of machine and oil engine with all necessary fittings is about £1,000. As far as I am aware there are no small machines that can be depended upon to turn out first class fibre from Agavé leaves. These, as you are aware, are so large and heavy that a powerful machine is absolutely necessary to deal with them. I have no confidence that any hand power machine could be constructed sufficiently strong to clean any full sized Agave leaves such as could produce good commercial fibre. If you desire further information with regard to this subject, I recommend you to obtain a copy of "Colonial Reports, Miscellaneous No. 5, Bahamas. The Sisal industry, London: Eyre and Spottiswoode, 1896, price 1½". You might also usefully consult "The Agaves, a remarkable group of useful plants". Reprint from Year Book of the U. S. Department of Agriculture for 1902."

In support of the above opinion by an experienced and high authority, it may be mentioned that Todd's machine is the one now employed by the South Indian Fibre Company.

Another machine which has done excellent work in extracting fibre of a somewhat similar, but inferior texture, is the Mauritius, *gratte*, which is used for extracting the hemp of that colony from *Furcræa gigantea*. It is worked by steam or water power (3 h. p.) and costs Rs. 250. If a machine of this class could be adapted to the Sisal industry in India, it would lessen the initial outlay where limited tracts of cultivation are concerned.

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